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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/554,388	10/25/2005	Yasuhiro Yamamoto	2936-0252PUS1	2714
2292	7590	10/26/2007	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH			HANNON, THOMAS R	
PO BOX 747			ART UNIT	PAPER NUMBER
FALLS CHURCH, VA 22040-0747			3682	
NOTIFICATION DATE.		DELIVERY MODE		
10/26/2007		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/554,388	YAMAMOTO ET AL.
	<b>Examiner</b> Thomas R. Hannon	<b>Art Unit</b> 3682

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1-16 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 25 October 2005 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:  
1. Certified copies of the priority documents have been received.  
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 10/25/05 11/30/05 7/10/07
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_.

The drawings are objected to under 37 CFR 1.84(h)(3) because parts in section are not hatched (Figure 1). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The disclosure is objected to because of the following informalities: in paragraph [0040], line 2, "steal" should be changed to --steel--.

Appropriate correction is required.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The claims purport to claim a “pump”, yet no pump structure is claimed.

With respect to claims 4-6, the ratio is not clearly defined. A ratio implies a comparison between two values, but only a slot radius of the inner ring is set forth, no comparison is made to another value to define a ratio. The claim must be amended to properly define the ratio is between the slot radius and the ball diameter.

With respect to claim 13 the limitation of “a rotating ring” is an improper double inclusion of a previously set forth element. That is, there is no additional rotating ring. The claim must be amended such that one of the previously set forth inner or outer rings define a rotational ring, and wherein a cage holding the balls is guided by the rotating ring.

With respect to claim 14, similarly to claim 13, the limitation of “a fixed ring” is an improper double inclusion of one of the previously set forth inner or outer ring.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 7-9, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al. US 6,558,139 in view of Ooitsu et al. US 2003/0063825. Nguyen discloses a pump including a main shaft (14) supported by a bearing (16). The bearing has an inner ring, an outer ring and balls thereof formed of the same material that is both hard and durable at the very low temperature of the fluid to be pumped (column 4, lines 9-11). Nguyen further discloses a bearing assembly with ceramic balls, stainless steel races and a polymeric cage (column 4, lines 24-25). Ooitsu discloses a rolling bearing in which the inner and outer races and the rolling elements are formed from corrosion-resistant material (paragraph [0062]). Ooitsu discloses that "ceramic material may be used instead of metal material" for the corrosion-resistant material. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the assembly of Nguyen such that the material of inner and outer races and the balls are formed of the same material, including that of ceramic in view of the teaching of Ooitsu. With respect to claim 2, Ooitsu discloses the cage holding the balls being guided by an outer ring (paragraph [0037]). With respect to claims 3, 15, and 16, both Nguyen and Ooitsu disclose the use of PEEK as a material for the cage; Ooitsu disclosing the use of solid lubricant. With respect to claims 7-9, the shaft 14 of Nguyen is hollow. With respect to claims 13 and 14, it would have been obvious to one of ordinary skill in the art at the time the invention was made to guide the cage on the rotating ring of the assembly or on the fixed ring of the assembly, as such guiding of a cage is notoriously old and well known in the bearing art. With respect to the preamble language of "carrying supercritical CO<sub>2</sub> fluid or liquid CO<sub>2</sub>", this is merely a recitation of intended use; the pump of Nguyen is capable of carrying a supercritical fluid in view of its structural similarity to the claimed structure.

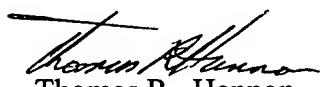
Claims 4-6 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al. US 6,558,139 in view of Ooitsu et al. US 2003/0063825 as applied to claims 1-3 above, and further in view of Sugimori et al. US 2003/0077015. Sugimori discloses a bearing assembly in which the radius of the inner ring is more than 52% of the ball diameter. It would have been obvious to one of ordinary skill in the art at the time the invention was made to fix the ratio of the inner raceway groove to the ball diameter of Nguyen for the desired purpose of reducing the bearing torque and fretting damage, as taught and suggested by Sugimori.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R. Hannon whose telephone number is (571) 272-7104. The examiner can normally be reached on Monday-Thursday (8:30-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571) 272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Thomas R. Hannon  
Primary Examiner  
Art Unit 3682

trh